

# Assessment of the conservation priority status of South African estuaries for use in management and water allocation

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## Abstract

The future health and productivity of South Africa's approximately 250 estuaries is dependent on two main factors: management and freshwater inputs. Both management and water allocation decisions involve trade-offs between conservation and various types of utilisation. In order to facilitate decision-making in both of these spheres, it is necessary to understand the relative conservation importance of different estuaries. This study devises a method for prioritising South African estuaries on the basis of conservation importance, and presents the results of a ranking based on the collation of existing data for all South African estuaries. Estuaries are scored in terms of their size, type and biogeographical zone, habitats and biota (plants, invertebrates, fish and birds). Thirty-three estuaries are currently under formal protection, but they are not representative of all estuarine biodiversity. We performed a complementarity analysis, incorporating data on abundance where available, to determine the minimum set of estuaries that includes all known species of plants, invertebrates, fishes and birds. In total, 32 estuaries were identified as 'required protected areas', including 10 which are already protected. An estuary's importance status (including 'required protected area' status) will influence the choice of management class and hence freshwater allocation under the country's new Water Act, and can be used to assist the development of a new management strategy for estuaries, which is currently underway.

## Introduction

There are approximately 250 functional estuaries in South Africa (Whitfield, 2000), together making up about 70 000 ha of one of the country's most productive habitats. Estuaries are well-known for their biodiversity, productive fish and invertebrate fisheries and for the important functions that they perform, such as providing nursery areas for marine fish, conduits for species which move between ocean and rivers (e.g. some eels and invertebrates) and feeding and staging sites for significant populations of migratory birds (Skelton, 1993; Turpie 1995). They also support a number of endemic species, many of which depend on estuaries for their survival. However, estuaries constitute one of the most threatened habitats in the country. In the past few decades there has been a plethora of marina and resort developments, reclamation and increasing human disturbance and exploitation. In many cases, freshwater inflows, vital to the maintenance of salinity profiles, sediment scouring and nutrient supply, have been siphoned off or polluted. As a result of all of these pressures, many South African estuaries have become functionally degraded, and this has frequently been accompanied by a loss of species (e.g. Goliath Heron from the Swartkops, Estuarine Pipefish from the Kariega – Whitfield, 1998) or a reduction in populations (Love, 2000; Wooldridge, 1999).

The future health of South Africa's estuaries is dependent on two main factors: their direct management and the quantity and quality of freshwater inputs. Very little consideration has been given to either in the past, but both of these aspects are currently under review in South Africa. Their management has now been entrusted to Marine & Coastal Management, Department of Environment Affairs & Tourism by the Marine Living Resources Act (Act 18 of 1998), and their water allocation is now being considered under the new National Water Act (Act 36 of 1998). Through the resource-directed measures (RDM) process, the latter will ensure a freshwater supply or 'reserve' for estuaries to maintain their ecological functioning, but the level of the reserve may vary, depending on socio-economic goals, to maintain estuaries in anything from a near-pristine state to a satisfactorily-functioning, but altered state (Adams et al., 1999).

Relative conservation importance is an important consideration in the decision-making processes regarding the management of or freshwater allocation to estuaries. Because of the demands for consumptive and non-consumptive use of estuaries, and for water from their catchments, it is not practical to ensure the high-quality functioning of all South African estuaries. Thus it is essential to formulate a sound way of prioritising estuaries in terms of their conservation importance, and to use this in determining the ways in which estuaries are managed and to what extent their water requirements are secured. The quantity and quality of water allocated to the estuarine reserve will be determined by the management class assigned to an estuary. Management class, in turn, will be assigned on the basis of an estuary's health and

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